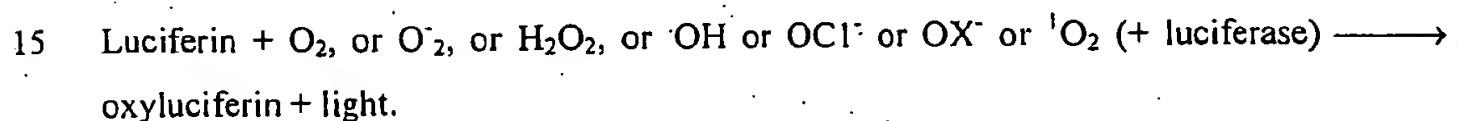




PROTEIN AND DNA CODING THEREFOR

The present invention relates to a protein, capable of bioluminescence, cDNA coding therefor and their uses, *inter alia*, in diagnostics and therapy. In particular, this invention relates to the cloning and sequencing of cDNA coding for pholasin from the bivalve mollusc *Pholas dactylus*.

The term 'bioluminescence' refers to the emission of light resulting from a chemical reaction within, or produced by, a living organism. The essential components to the chemical reaction are: an organic molecule, usually comprising a luciferin; oxygen or one of its metabolites; and an enzyme or luciferase that catalyses the oxidation of the luciferin. The chemiluminescent reaction responsible for bioluminescence may be represented as follows:



Up to three other substances may also be required to generate light or to generate light of the required colour and intensity. These are as follows:

- A cation, such as H⁺, Ca²⁺, Mg²⁺ or a transition metal cation (eg Cu⁺/Cu²⁺, Fe²⁺/Fe³⁺, La³⁺ and V³⁺);
- A co-factor such as NAD(P)H, FMN or ATP; and/or
- A fluor as an energy transfer acceptor.

Five chemical families of luciferin are known:

- Aldehydes (found in the freshwater limpet *Latia*, earthworms, and with FMN in bacteria);
- Imidazolopyrazines, which are the compounds most commonly responsible for bioluminescence in the sea (found in Sarcodistigophora, Cnidaria, Ctenophora, Annelida, Chaetognatha, some Arthropoda, some Mollusca and some Chordata);
- Benzothiazoles (found in beetles such as fireflies and glow-worms);
- Linear tetrapyrroles (found in dinoflagellates, euphausiid shrimp and some fish);

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